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Brown

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(54) **ORGANIZING A PLURALITY OF ITEMS INTO A DELIVERY POINT SEQUENCE**

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(51) **Int. Cl.**
B07C 5/00 (2006.01)

(52) **U.S. Cl.** **209/584**; 209/900

(58) **Field of Classification Search** 209/583, 209/584, 900; 235/375, 379, 380, 381, 382
See application file for complete search history.

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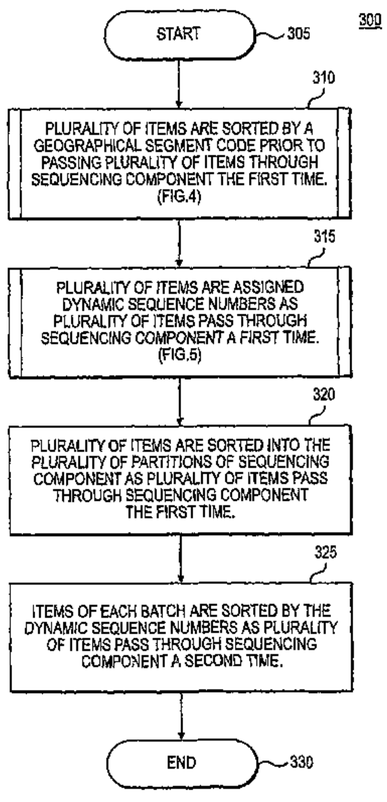
(57) **ABSTRACT**

A method and system for providing delivery point sequencing consistent with the invention includes assigning the plurality of items dynamic sequence numbers as the plurality of items pass through a sequencing component a first time, the sequencing component component comprising a plurality of partitions. Next the method and system include sorting the plurality of items into the plurality of partitions of the sequencing component as the plurality of items pass through the sequencing component the first time, each partition having a corresponding batch of items. And finally the method and system include sorting the items of each batch by the dynamic sequence numbers as the plurality of items pass through the sequencing component a second time, each of the plurality of partitions sorting only items of its corresponding batch.

24 Claims, 5 Drawing Sheets



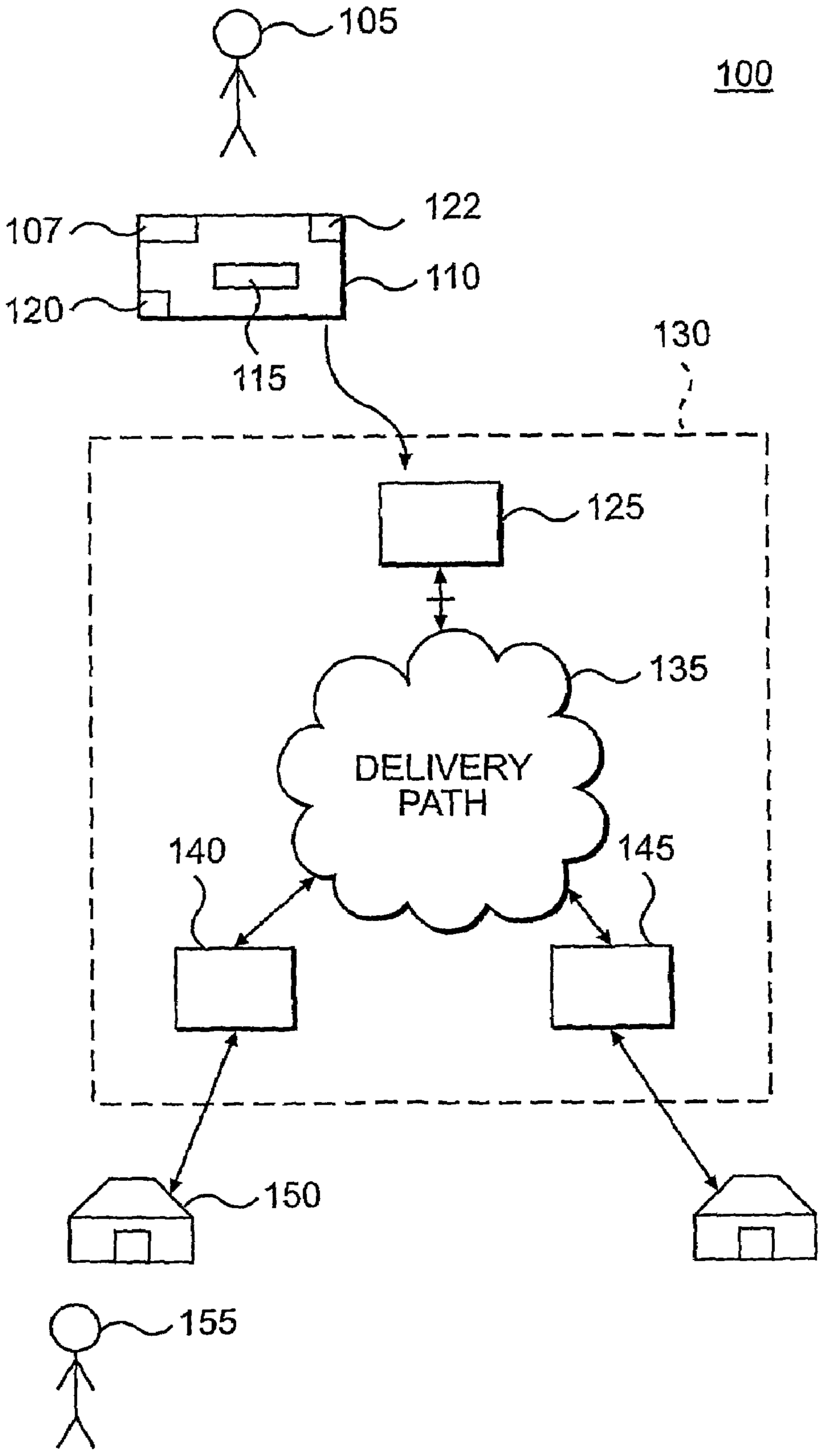

105
100
107
122
110
120
115
130
125
135
DELIVERY PATH
140
145
150
155

FIG. 1

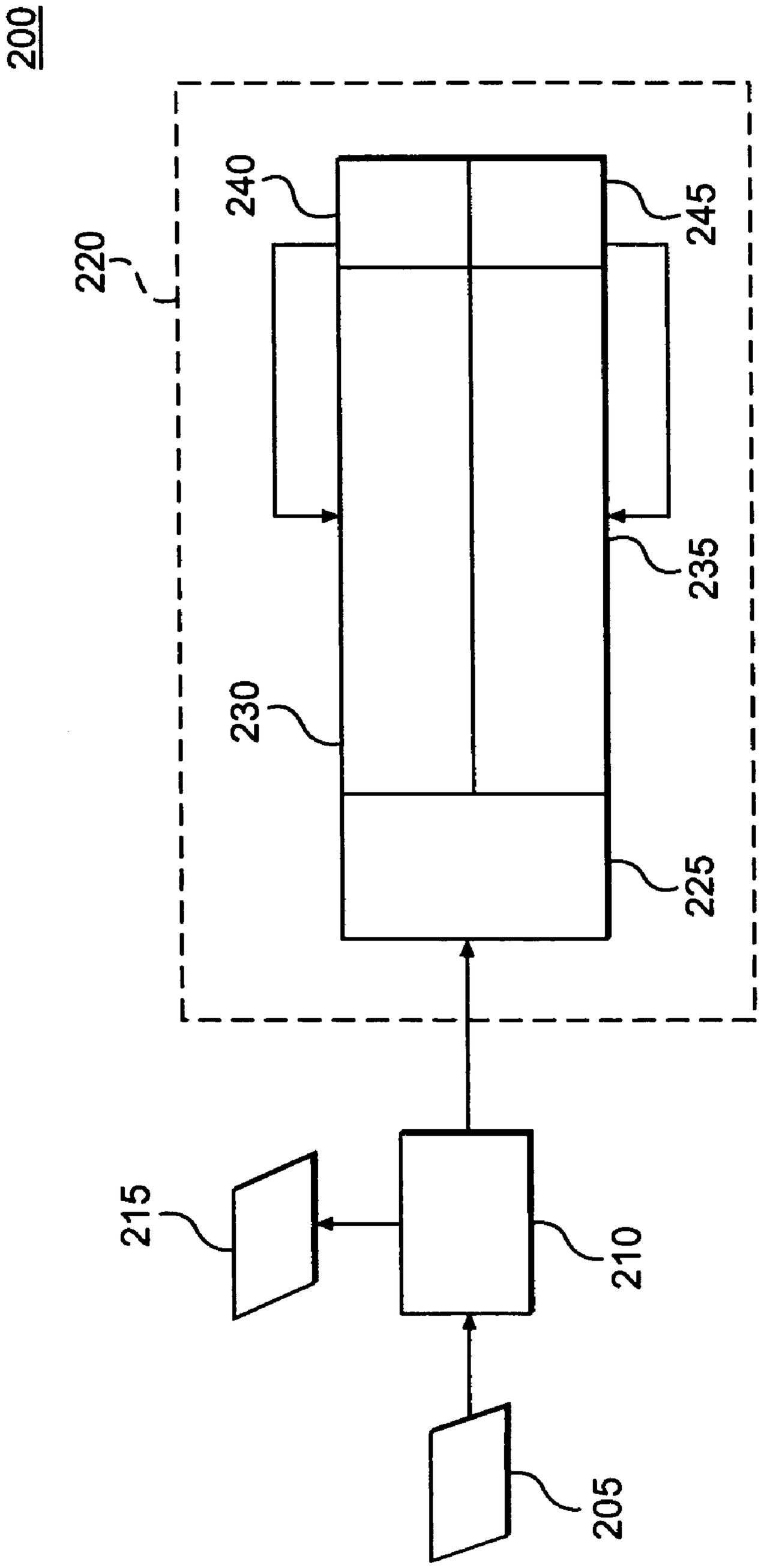


FIG. 2

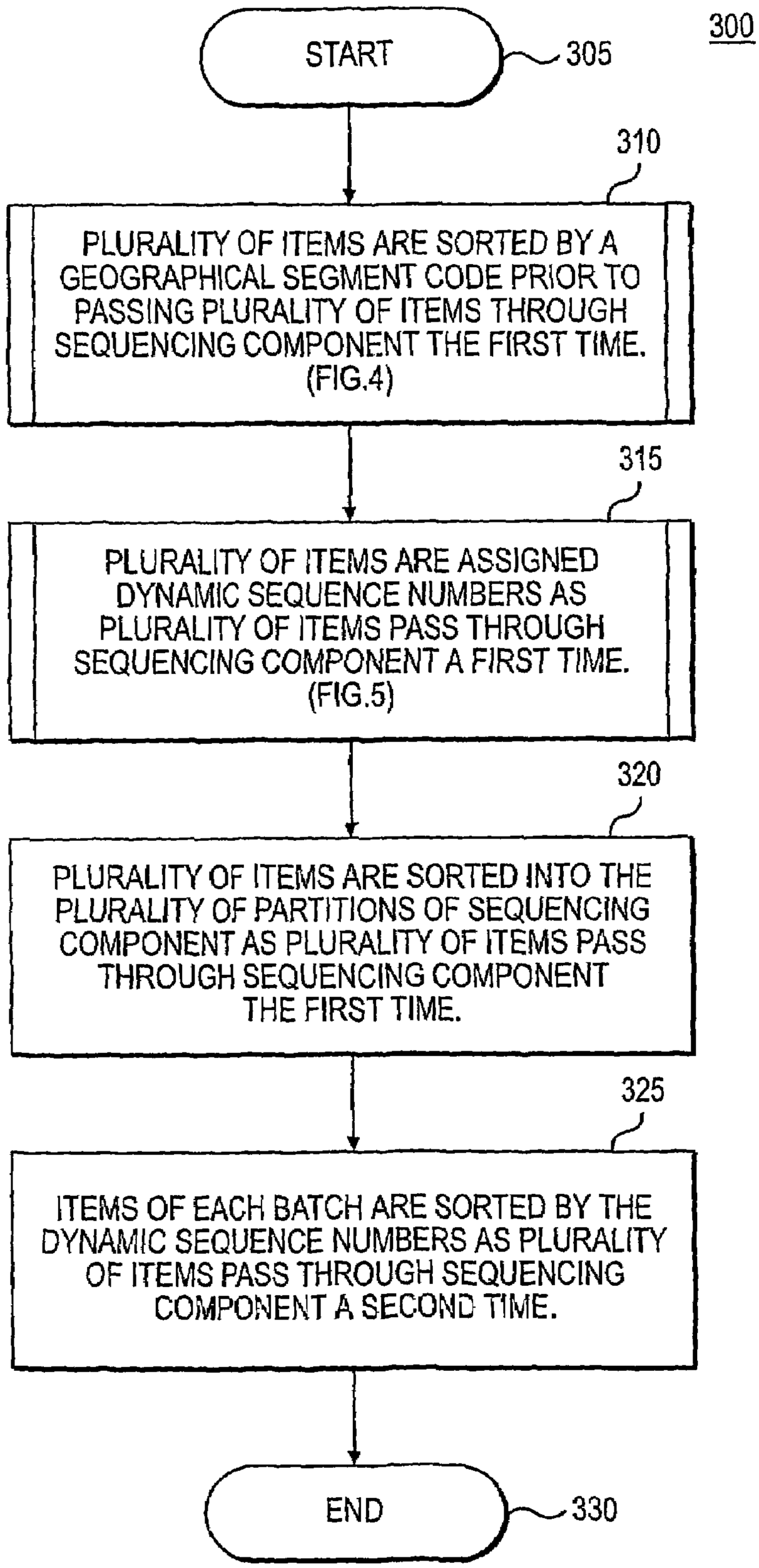

300
START
305
310
PLURALITY OF ITEMS ARE SORTED BY A GEOGRAPHICAL SEGMENT CODE PRIOR TO PASSING PLURALITY OF ITEMS THROUGH SEQUENCING COMPONENT THE FIRST TIME. (FIG.4)
315
PLURALITY OF ITEMS ARE ASSIGNED DYNAMIC SEQUENCE NUMBERS AS PLURALITY OF ITEMS PASS THROUGH SEQUENCING COMPONENT A FIRST TIME. (FIG.5)
320
PLURALITY OF ITEMS ARE SORTED INTO THE PLURALITY OF PARTITIONS OF SEQUENCING COMPONENT AS PLURALITY OF ITEMS PASS THROUGH SEQUENCING COMPONENT THE FIRST TIME.
325
ITEMS OF EACH BATCH ARE SORTED BY THE DYNAMIC SEQUENCE NUMBERS AS PLURALITY OF ITEMS PASS THROUGH SEQUENCING COMPONENT A SECOND TIME.
END
330

FIG. 3

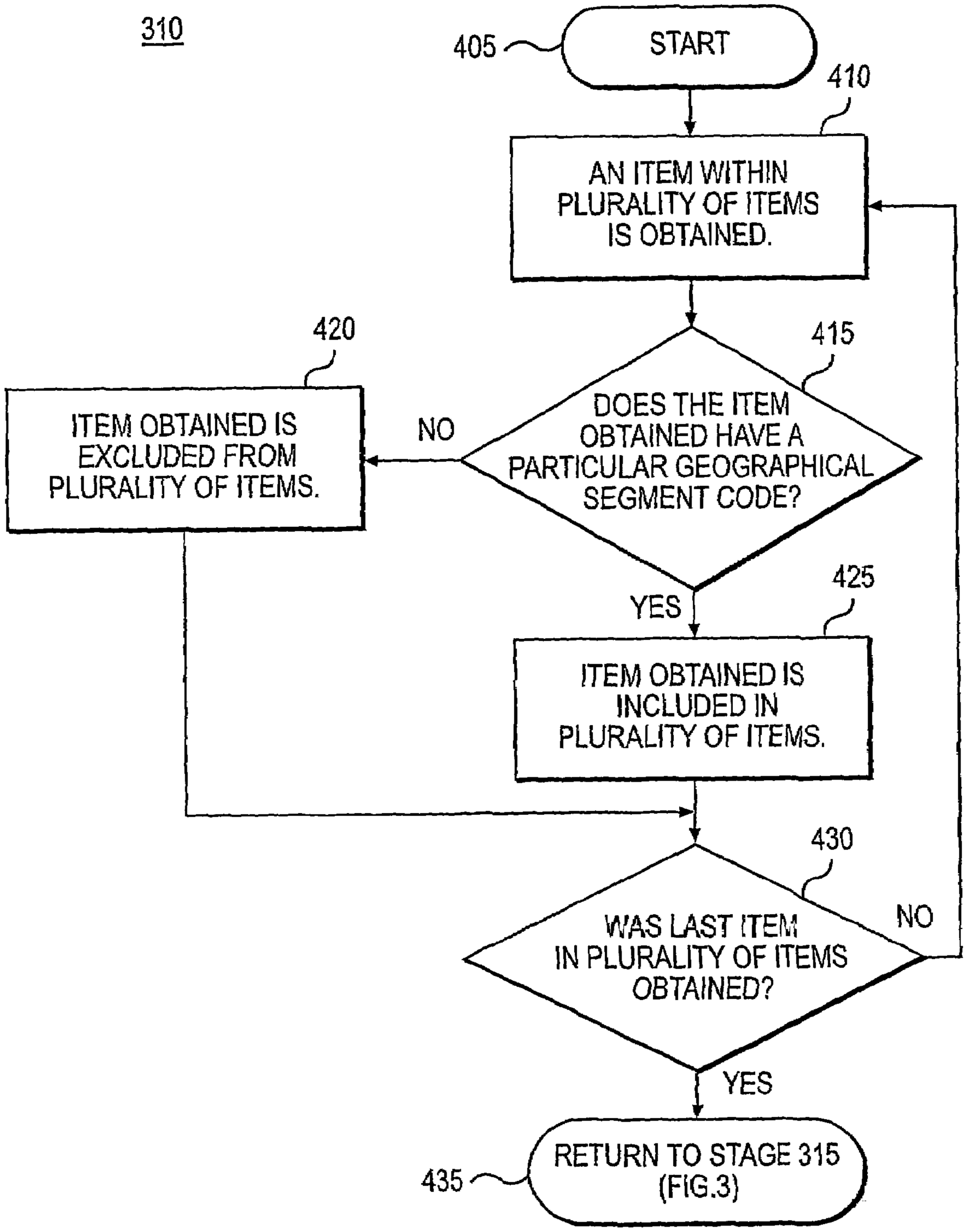

310
405
START
410
AN ITEM WITHIN PLURALITY OF ITEMS IS OBTAINED.
415
DOES THE ITEM OBTAINED HAVE A PARTICULAR GEOGRAPHICAL SEGMENT CODE?
NO
420
ITEM OBTAINED IS EXCLUDED FROM PLURALITY OF ITEMS.
YES
425
ITEM OBTAINED IS INCLUDED IN PLURALITY OF ITEMS.
430
WAS LAST ITEM IN PLURALITY OF ITEMS OBTAINED?
NO
YES
435
RETURN TO STAGE 315 (FIG.3)

FIG. 4

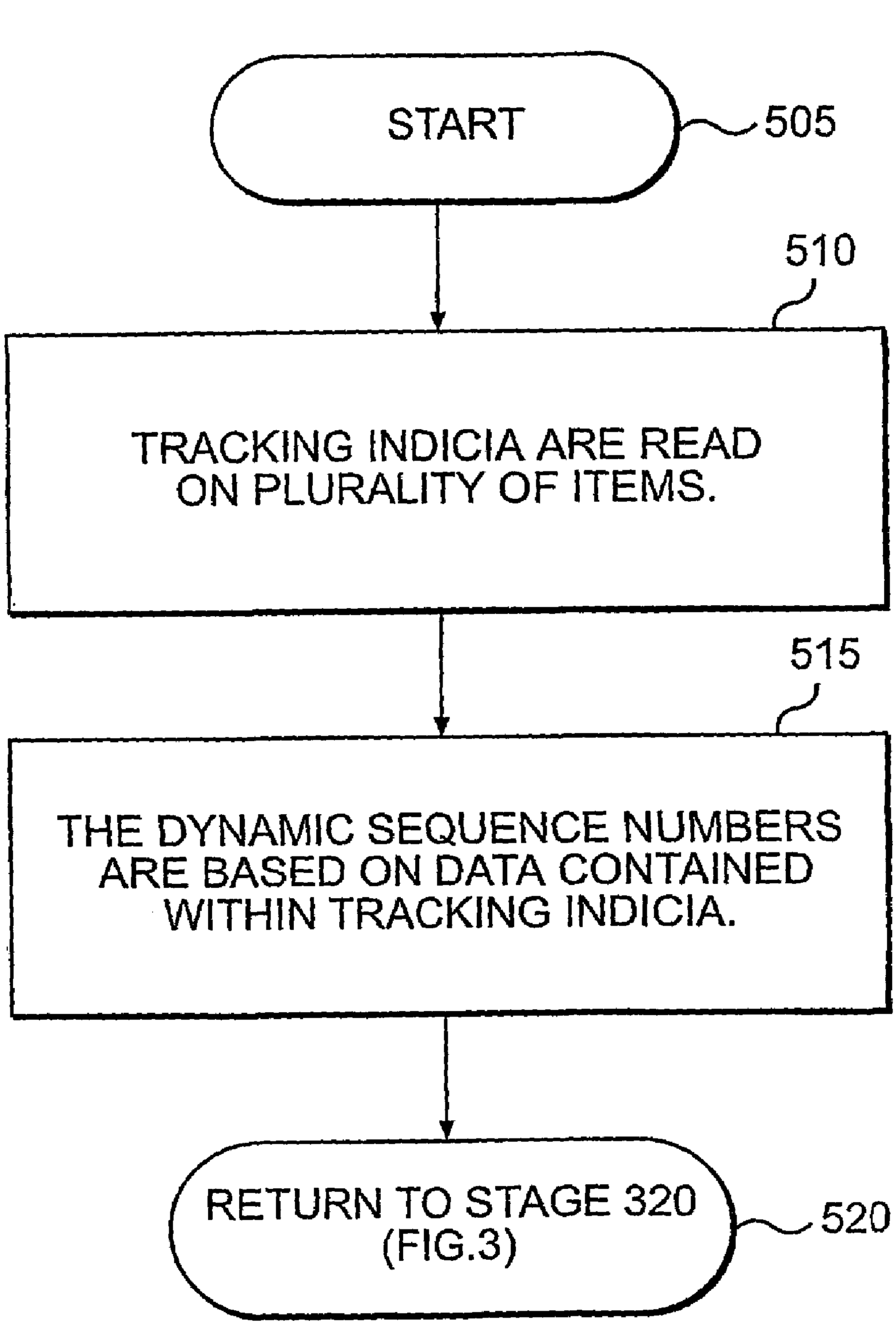

315
START
505
510
TRACKING INDICIA ARE READ ON PLURALITY OF ITEMS.
515
THE DYNAMIC SEQUENCE NUMBERS ARE BASED ON DATA CONTAINED WITHIN TRACKING INDICIA.
RETURN TO STAGE 320 (FIG.3)
520

FIG. 5

ORGANIZING A PLURALITY OF ITEMS INTO A DELIVERY POINT SEQUENCE

RELATED APPLICATION

Under provisions of 35 U.S.C. § 119(e), the Applicant claims the benefit of U.S. provisional application No. 60/255,144 filed Dec. 14, 2000, which is incorporated herein by reference.

TECHNICAL FIELD

The present invention relates to the field of organizing items. More particularly, the present invention, in various specific embodiments, involves methods and systems directed to organizing a plurality of items into a delivery point sequence.

BACKGROUND

With the advent and steady growth of electronic mail and electronic commerce for messages and ordering, traditional mail, that is, the physical mail stream, will increasingly be utilized for sending and receiving packages and other types of mail pieces. In an effort to lower operating costs and increase value for their customer base, many high-volume delivery system operators sort items with automated equipment. Delivery system operators realize a cost savings by organizing a plurality of items into a delivery point sequence. For example, organizing a plurality of items into a delivery point sequence allows a delivery system operator to merely take the organized plurality of items and deliver the items in a sequence corresponding to a particular route.

Therefore, there is a need for delivery system operators, such as the United States Postal Service (USPS) and other organizations, to better organize items. More specifically, delivery system operators desire to efficiently organize a plurality of items into a delivery point sequence. This is because in an increasingly competitive environment, it is essential for a delivery system operator to reduce costs and exceed the expectations of those who receive a service. Efficiently providing item organization remains an elusive goal. Thus, there remains a need for efficiently providing item organization in an item delivery system. In addition, there remains a need for efficiently organizing a plurality of items into a delivery point sequence.

SUMMARY OF THE INVENTION

In one aspect, a method for organizing a plurality of items into a delivery point sequence includes passing the plurality of items through a sequencing component a first time wherein the sequencing component assigns the plurality of items dynamic sequence numbers, and sorting the plurality of items by the dynamic sequence numbers as the plurality of items pass through the sequencing component a second time.

In another aspect, a method for organizing a plurality of items into a delivery point sequence includes assigning the plurality of items dynamic sequence numbers as the plurality of items pass through a sequencing component a first time, the sequencing component comprising a plurality of partitions, sorting the plurality of items into the plurality of partitions of the sequencing component as the plurality of items pass through the sequencing component the first time, each partition having a corresponding batch of items, and sorting the items of each batch by the dynamic sequence numbers as the plurality of items pass through the sequencing component a second time, each of the plurality of partitions sorting only items of its corresponding batch.

In yet another aspect, a system for organizing a plurality of items into a delivery point sequence includes a component for assigning the plurality of items dynamic sequence numbers as the plurality of items pass through a sequencing component a first time, the sequencing component comprising a plurality of partitions, a sorting component the plurality of items into the plurality of partitions of the sequencing component as the plurality of items pass through the sequencing component the first time, each partition having a corresponding batch of items, and a sorting component the items of each batch by the dynamic sequence numbers as the plurality of items pass through the sequencing component a second time, each of the plurality of partitions sorting only items of its corresponding batch.

Both the foregoing general description and the following detailed description are exemplary and are intended to provide further explanation of the invention as claimed.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings provide a further understanding of the invention and, together with the detailed description, explain the principles of the invention. In the drawings:

FIG. **1** is a functional block diagram of a system for providing item delivery service consistent with the present invention;

FIG. **2** is a functional block diagram of a system for organizing a plurality of items into a delivery point sequence consistent with the present invention;

FIG. **3** is a flow chart of an exemplary method for organizing a plurality of items into a delivery point sequence consistent with the present invention;

FIG. **4** is a flow chart of an exemplary subroutine used in the exemplary method of FIG. **3** for sorting by a geographical segment code prior to passing a plurality of items through a sequencing component a first time; and

FIG. **5** is a flow chart of an exemplary subroutine used in the exemplary method of FIG. **3** for assigning a plurality of items dynamic sequence numbers as the plurality of items pass through the sequencing component the first time.

DETAILED DESCRIPTION

Reference will now be made to various embodiments consistent with this invention, examples of which are shown in the accompanying drawings and will be obvious from the description of the invention. In the drawings, the same reference numbers represent the same or similar elements in the different drawings whenever possible.

Exemplary Item Delivery System

FIG. **1** shows an exemplary item delivery system **100** that may be used in conjunction with the present invention. Within item delivery system **100**, for example, an item **110** may be prepared manually by a user **105** or may be prepared utilizing an inserter under the supervision of user **105**. An inserter is an automated device capable of assembling item **110** which may comprise a mailpiece, such as a United States Postal Service Express Mail package. While item **110** may comprise any of the aforementioned, those skilled in the art will appreciate that still many other types of items may be utilized.

In exemplary item delivery system **100**, materials are placed in item **110** that user **105** wishes to send to a recipient **155**. With the materials placed in item **110**, an address label **115** is placed on item **110** indicating a first address **150** of a

recipient **155** and a return address **107** indicating where to return item **110**, if necessary. In addition, a tracking indicia **120** is placed on item **110** along with a delivery payment coding **122**. Tracking indicia **120** is utilized by a delivery system operator to facilitate the delivery of item **110**. The use of tracking indicia **120** will be discussed in greater detail below. Delivery payment coding **122** indicates the payment amount user **105** believes is required by the delivery system operator to deliver item **110** to recipient **155**. Delivery payment coding **122** may comprise a bar code, an image indicating an account from which delivery payment has been made, a postage stamp, or other types of codings as are known by those skilled in the art.

Tracking indicia **120** may comprise a bar code, a PLANET code or other types of indicia as are known by those skilled in the art. A bar code is a printed symbol used for recognition by a bar code scanner (reader). Traditional one-dimensional bar codes use the bar's width to encode a product or account number. Two-dimensional bar codes, such as PDF417, MAXICODE and DATAMATRIX, are scanned horizontally and vertically and hold considerably more data. Generally, PDF417 is widely used for general purposes, MAXICODE is used for high-speed sorting, and DATAMATRIX is used for marking small parts.

Historically, some delivery system operators sorted flat mail using POSTNET, a 12-digit barcode developed by the USPS consisting of alternating long and short bars indicating the destination of, for example, a mailpiece. Responding to the expanding needs of users, particularly heavy volume users, the PLANET code was developed on the foundation of the existing technical infrastructure. The PLANET Code is, in one respect, the opposite of the current POSTNET codes, reversing long bars for short and short bars for long. This innovation offers the convenience of a bar code that is easily applied using current bar-coding methods, and is readily scanned by the high-speed automation equipment already located in the plurality of plants comprising a delivery system **130** as discussed below.

In sending item **110**, for example, user **105** places item **110** into a delivery system **130** at a sender plant **125**. Item **110** is routed through delivery system **130** comprising sender plant **125**, a delivery path **135**, a first address plant **140**, and a second address plant **145**. Delivery path **135** comprises a plurality of plants similar to sender plant **125**, first address plant **140**, and second address plant **145**. The plants within delivery system **130** contain, among other things, automated systems and sorting equipment and are designed to receive and process a plurality of items. Delivery system **130** is configured to sense tracking indicia **120** placed on item **110** as it passes through the elements of delivery system **130** directing the movement of item **110** through delivery system **130**. Tracking indicia **120** sensed by delivery system **130** may comprise a bar code, a PLANET code, or other indicia as described herein above.

In the delivery process, item **110** is routed to the next most appropriate plant in delivery system **130**. The appropriateness of the next plant in delivery system **130** depends upon the present location of the particular item in delivery system **130** and where item **110** is addressed. Ultimately, item **110** is routed in delivery system **135** to the plant that serves the delivery address indicated on item **110**, according to established procedures. Thus, item **110** is routed from plant to plant within delivery system **130** wherein item **110** efficiently converges on the plant that serves the delivery address indicated on the item, in this case, first address plant **140**. Throughout this process, delivery system **130** tracks the progress of items **110** through delivery system **130**.

System for Organizing a Plurality of Items

Consistent with the general principles of the present invention, a system for organizing a plurality of items into a delivery point sequence comprises a component for assigning the plurality of items dynamic sequence numbers as the plurality of items pass through a sequencing component a first time, the sequencing component comprising a plurality of partitions. In addition, the system comprises a sorting component the plurality of items into the plurality of partitions of the sequencing component as the plurality of items pass through the sequencing component the first time, each partition having a corresponding batch of items. And finally, the system comprises a sorting component the items of each batch by the dynamic sequence numbers as the plurality of items pass through the sequencing component a second time, each of the plurality of partitions sorting only items of its corresponding batch.

As herein embodied and illustrated in FIG. **2**, an organizing system **200** comprises a plurality of items **205**, a sorting component **210**, excluded items **215**, and a sequencing component **220**. In the exemplary embodiment of FIG. **2**, the component for assigning the plurality of items dynamic sequence numbers, the sorting component the plurality of items into the plurality of partitions, and the sorting component the items of each batch by the dynamic sequence numbers may all be embodied in sequencing component **220**.

Items **205** may comprise flat mail, catalogs, magazines, mailpieces, and United States Postal Service Express Mail Packages. In addition, items **205** may be configured and labeled in a similar manner to item **110**, as described above with respect to FIG. **1**. Those skilled in the art will appreciate that items **205** may comprise other types of items and may be configured or labeled in other manners.

Sorting component **210** may comprise automated systems and high-speed automated sorting equipment containing, for example, image capturing systems such as digital video cameras. Sorting component **210** may be controlled by a personal computer or other similar microcomputer-based workstation. Those skilled in the art, however, will appreciate that sorting component **210** may be controlled by other types of computerized devices, such as hand-held devices, multiprocessor systems, microprocessor-based or programmable consumer electronics, minicomputers, mainframe computers, and the like. Sorting component **210** may also be practiced in distributed computing environments where tasks are performed by remote processing devices and may have the capability of connecting to a communications system. The communications system may comprise a wire line communications system, a wire line network, a wireless communications system, or a wireless network. "Wireless" can be defined as radio transmission via the airwaves, however, those skilled in the art will appreciate that various other communication techniques can be used to provide wireless transmission including infrared line of sight, cellular, microwave, satellite, packet radio, and spread spectrum radio.

Sequencing component **220** may comprise a component for assigning the plurality of items dynamic sequence numbers **225**, a first partition **230**, a second partition **235**, a first partition batch **240**, and a second partition batch **245**. Similar to sorting component **210**, sequencing component **220** may comprise automated systems and high-speed automated sorting equipment containing, for example, image capturing systems such as digital video cameras. Sequencing component **220** may also be controlled by a personal computer or other similar microcomputer-based workstation. Those skilled in the art, however, will appreciate that sequencing component **220** may be controlled by other types of computerized

devices, such as hand-held devices, multiprocessor systems, microprocessor-based or programmable consumer electronics, minicomputers, mainframe computers, and the like. Sequencing component **220** may also be practiced in distributed computing environments where tasks are performed by remote processing devices and may have the capability of connecting to a communications system. The communications system may comprise a wire line communications system, a wire line network, a wireless communications system, or a wireless network.

Sequencing component **220**, for example, may be configured to accept plurality of items **205**, and scan information from individual items contained within items **205**. Based on the information scanned from such individual items, sequencing component **220** may be further configured to route the individual items through partitions of sequencing component **220** such as first partition **230** and second partition **235**. Once processed through the partitions of sequencing component **220**, items **205** are segregated into batches such as first partition batch **240** and second partition batch **245**. In addition, sequencing component **220** may be further configured to perform other processes and sort individual items contained in the batches by re-feeding the individual items contained in the batches through the partitions that produced them.

Method for Organizing a Plurality of Items

FIG. **3** is a flow chart setting forth the general stages involved in an exemplary method **300** for organizing a plurality of items into a delivery sequence. Exemplary method **300** begins at starting block **305** and proceeds to exemplary subroutine **310** where items **205** are sorted by a geographical segment code prior to passing through sequencing component **220** the first time. The stages of subroutine **310** are shown in FIG. **4** and will be discussed in greater detail below.

From subroutine **310**, method **300** advances to exemplary subroutine **315** where **205** are assigned dynamic sequence numbers as they pass through sequencing component **220** a first time. The stages of subroutine **315** are shown in FIG. **5** and will be discussed in greater detail below.

After items **205** are assigned dynamic sequence numbers in subroutine **315**, method **300** continues to stage **320** where items **205** are sorted into the plurality of partitions of sequencing component **220** as they pass through sequencing component **220** the first time. Each partition may correspond to a route within a delivery system.

For example, first partition **230** may correspond to a first route within item delivery system **100** and second partition **235** may correspond to a second route within item delivery system **100**. When items **205** are sorted into the plurality of partitions, organizing system **200** may, for example, read the dynamic sequence number of an individual item. Based on the dynamic sequence number read, organizing system **200** may then route the item to the partition corresponding to the route that contains the delivery point for the item. Thus, if the delivery point for the item is contained in the route corresponding to first partition **230**, organizing system **200** routes the item to first partition **230**.

The size of the partitions may vary based upon historical data, volume of items in each of the plurality of batches, and the time it would take a delivery system operator to deliver the items in the batch corresponding to the partition. For example, if the route corresponding to first partition **230** is historically larger than the route corresponding to second partition **235**, first partition **230** may be physically larger than second partition **235**. Similarly, the partitions may be adjusted dynamically as the volume of items are processed during the operation of organizing system **200**.

Once items **205** are sorted in stage **320**, method **300** advances to stage **325** where items of each batch are sorted by the dynamic sequence numbers as items **205** pass through sequencing component **220** a second time. For example, during this second pass, each partition processes only the items that passed through the partition during the first pass. In performing this second pass, the items are routed from the batches and back through their corresponding partition. For example, items of first partition batch **240** will be processed by first partition **230** and items of second partition batch **245** will be processed by second partition **235**.

In sorting the items by dynamic sequence numbers, the items are arranged substantially in the order by which they are to be delivered. For example, for a given route with 100 delivery points, the item with dynamic sequence number 1 is at the beginning of the route, while the item with dynamic sequence number 100 corresponds to the delivery point that is last on the route. The delivery sequence within a route may be arranged to economize time and effort in delivering the items.

From stage **325**, method **300** ends at stage **330**.

Sorting by a Geographical Segment Code

FIG. **4** is a flow chart setting forth the general stages involved in subroutine **310** for sorting by a geographical segment code prior to passing items **205** through sequencing component **220** the first time. Subroutine **310** begins at starting block **405** and proceeds to stage **410** where an item within plurality of items **205** is selected at random from items **205**.

Once an item **205** is selected, subroutine **310** continues to decision block **415** where it is determined if the selected item has a particular geographical segment code. The particular geographical segment code may be predetermined by the operator of organizing system **200** for the particular operation to be performed by organizing system **200**. The geographical segment code on the selected item may be obtained by scanning the tracking indicia on the selected item or by scanning the address label with a digital camera or other type of scanning device. If the address label is scanned, character recognition software may be employed to extract a geographical segment code data from the scanned image of the address label. The geographical segment code may comprise a United States Postal Service ZIP code, or a United States Postal Service ZIP+4 code. Those skilled in the art will appreciate that the geographical segment code may comprise may other types of codings, markings, printings or labels.

If it is determined at decision block **415** that selected item does not have a particular geographical segment code, exemplary subroutine **310** advances to stage **420** where selected item is excluded from plurality of items **205**. In this case, the item may be routed within organizing system **200** to a holding area (not shown) and held there for further processing. The selected item may be excluded from plurality of items **205** because the selected item may not correspond to a delivery point contained in the geographic area for which the present organizing system **200** operation is being performed.

However, if it was determined at decision block **415** that the selected item does have a particular geographical segment code, subroutine **310** advances to stage **425** where the selected item obtained is included in plurality of items **205** because the item obtained may correspond to a delivery point contained in the geographic area for which the present organizing system **200** operation is being performed.

From stage **420**, or stage **425**, subroutine **310** continues to decision block **430** where it is determined if the selected item was the last item in plurality of items **205**. If at decision block **430** it is determined that the selected item was not the last item, subroutine **310** continues to stage **410** and repeats the

stages of subroutine **310**. Each item within plurality of items **205** may be checked during this process. If at decision block **430**, however, it is determined that the item obtained was the last item in plurality of items, subroutine **310** advances to stage **435** and returns to stage **315** of FIG. **3**.

Assigning Dynamic Sequence Numbers

FIG. **5** is a flow chart setting forth the general stages involved in an exemplary subroutine **315** for assigning plurality of items **205** dynamic sequence numbers of items **205** pass through sequencing component **220** a first time. Subroutine **315** begins at starting block **505** and proceeds to stage **510** where tracking indicia are read on plurality of items. The tracking indicia may comprise a bar code or a PLANET code; however, tracking indicia may comprise other types of codings as are known by those skilled in the art.

Once tracking indicia are read, subroutine **315** advances to stage **515** where dynamic sequence numbers are created, based on data contained within tracking indicia. The dynamic sequence numbers may indicate the order in which items within the plurality of items **205** are to be delivered within a route. With the data obtained from the tracking indicia, a database may be queried in order to determine the dynamic sequence number that corresponds to the item. While the tracking indicia is used in this embodiment to provide data used to determine a dynamic sequence number, those skilled in the art will appreciate that other means, processes, labels, codings, or printings other than the tracking indicia may be employed to obtain the same or substantially similar information. From stage **515**, subroutine **315** advances to stage **520** and returns to stage **320** of FIG. **3**.

It will be appreciated that a system in accordance with an embodiment of the invention can be constructed in whole or in part from special purpose hardware or a general purpose computer system, or any combination thereof. Any portion of such a system may be controlled by a suitable program. Any program may in whole or in part comprise part of or be stored on the system in a conventional manner, or it may in whole or in part be provided in to the system over a network or other mechanism for transferring information in a conventional manner. In addition, it will be appreciated that the system may be operated and/or otherwise controlled by means of information provided by an operator using operator input elements (not shown) which may be connected directly to the system or which may transfer the information to the system over a network or other mechanism for transferring information in a conventional manner.

The foregoing description has been limited to a specific embodiment of this invention. It will be apparent, however, that various variations and modifications may be made to the invention, with the attainment of some or all of the advantages of the invention. It is the object of the appended claims to cover these and such other variations and modifications as come within the true spirit and scope of the invention.

Other embodiments of the invention will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is intended that the specification and examples be considered as exemplary only, with a true scope and spirit of the invention being indicated by the following claims.

I claim:

1. A method for organizing a plurality of items into a delivery point sequence comprising:

sorting the plurality of items by a geographical segment code prior to passing the plurality of items through a sequencing component, the sequencing component comprising a plurality of partitions,

Determining a maximum capacity of an individual partition based upon either historical data of the geographical segment code or a time predicted in will take to deliver the items in the batch corresponding to the individual partition;

Dynamically adjusting a size of the individual partition as the plurality of items are passed through the sequencing component;

passing the plurality of items through the sequencing component a first time wherein the sequencing component assigns dynamic sequence numbers to the plurality of items; and

sorting the plurality of items by the dynamic sequence numbers as the plurality of items pass through the sequencing component a second time.

2. The method of claim **1**, wherein items within the plurality of items that do not have a specified geographical segment code are excluded from the plurality of items.

3. The method of claim **1**, wherein the geographical segment code comprises at least one of the following: a United States Postal Service ZIP code, and a United States Postal Service ZIP+4 code.

4. The method of claim **1**, wherein items within the plurality of items comprise at least one of the following: flat mail, catalogs, magazines, mailpieces, and United States Postal Service Express Mail Packages.

5. The method of claim **1**, wherein the dynamic sequence numbers indicate the order in which items within the plurality of items are to be delivered within a route.

6. The method of claim **1**, wherein the sequencing component assigns the plurality of items the dynamic sequence numbers by reading tracking indicia on the plurality of items and basing the dynamic sequence numbers on data indicated by the tracking indicia.

7. The method of claim **6**, wherein the tracking indicia comprises at least one of the following: a bar code and a PLANET code.

8. A method for organizing a plurality of items into a delivery point sequence comprising:

sorting the plurality of items by a geographical segment code prior to passing the plurality of items through a sequencing component;

assigning dynamic sequence numbers to the plurality of items as the plurality of items pass through the sequencing component a first time, the sequencing component comprising a plurality of partitions;

sorting the items into the plurality of partitions of the sequencing component as the plurality of items pass through the sequencing component the first time, each partition having a corresponding batch of the items; and

sorting the items of each batch by the dynamic sequence numbers as the items pass through the sequencing component a second time, each of the plurality of partitions sorting only items of its corresponding batch,

Determining a maximum capacity of an individual partition based upon either historical data of the geographical segment code or a time predicted in will take to deliver the items in the batch corresponding to the individual partition;

Dynamically adjusting a size of the individual partition as the plurality of items are passed through the sequencing component.

9. The method of claim **8**, wherein each partition corresponds to a route within a delivery system.

10. The method of claim **8**, wherein sorting the plurality of items by a geographical segment code comprises:

identifying items within the plurality of items that do not have a specified geographical segment code; and

excluding the identified items from the plurality of items.

11. The method of claim **10**, wherein the geographical segment code comprises at least one of the following: a United States Postal Service ZIP code, and a United States Postal Service ZIP+4 code.

12. The method of claim **8**, wherein assigning the plurality of items dynamic sequence numbers further comprises:

reading tracking indicia on the plurality of items; and

basing the dynamic sequence numbers on data indicated by the tracking indicia.

13. The method of claim **12**, wherein the tracking indicia comprises at least one of the following: a bar code and a PLANET code.

14. The method of claim **8**, wherein items within the plurality of items comprise at least one of the following: flat mail, catalogs, magazines, mailpieces, and United States Postal Service Express Mail Packages.

15. The method of claim **8**, wherein the dynamic sequence numbers indicate the order in which items within the plurality of items are to be delivered within a route.

16. A system for organizing a plurality of items into a delivery point sequence comprising:

a sorting component that sorts the plurality of items by a geographical segment code prior to passing the plurality of items through a sequencing component, the sequencing component comprising a plurality of partitions;

A component for determining a maximum capacity of an individual partition based upon either historical data of the geographical segment code or a time predicted in will take to deliver the items in the batch corresponding to the individual partition;

A component that dynamically adjusts a size of the individual partition as the plurality of items are passed through the sequencing component;

a component for assigning dynamic sequence numbers to the items as the plurality of items pass through the sequencing component a first time;

a sorting component that sorts the plurality of items into the plurality of partitions as the items pass through the sequencing component the first time, each partition having a corresponding batch of items; and

a sorting component that sorts the items of each batch by the dynamic sequence numbers as the items pass through the sequencing component a second time, each of the plurality of partitions sorting only items of its corresponding batch.

17. The system of claim **16**, wherein each partition corresponds to a route within a delivery system.

18. The system of claim **16**, wherein items within the plurality of items that do not have a specified geographical segment code are excluded from the plurality of items.

19. The system of claim **16**, wherein the geographical segment code comprises at least one of the following: a United States Postal Service ZIP code, and a United States Postal Service ZIP+4 code.

20. The system of claim **16**, wherein the component for assigning the plurality of items dynamic sequence numbers further comprises:

a component for reading tracking indicia on the plurality of items; and

a component for basing the dynamic sequence numbers on data indicated by the tracking indicia.

21. The system of claim **20**, wherein the tracking indicia comprises at least one of the following: a bar code and a PLANET code.

22. The system of claim **16**, wherein items within the plurality of items comprise at least one of the following: flat mail, catalogs, magazines, mailpieces, and United States Postal Service Express Mail Packages.

23. The system of claim **16**, wherein the dynamic sequence numbers indicate the order in which items within the plurality of items are to be delivered within a route.

24. A method for organizing a plurality of items into a delivery point sequence comprising:

sorting the plurality of items by a geographical segment code, wherein items within the plurality of items that do not have a specified geographical segment code are excluded from the plurality of items, the geographical segment code comprising at least one of the following: a United States Postal Service ZIP code, and a United States Postal Service ZIP+4 code, items within the plurality of items comprising at least one of the following: flat mail, catalogs, magazines, mailpieces, and United States Postal Service Express Mail Packages;

assigning sequence numbers to the plurality of items as the plurality of items pass through a sequencing component a first time, wherein tracking indicia are read from the plurality of items and the sequence numbers are based on data indicated by the tracking indicia, the tracking indicia comprising at least one of the following: a bar code and a PLANET code, the sequence numbers indicating the order in which items within the plurality of items are to be delivered within a route, wherein the sequencing component comprises a plurality of partitions;

Determining a maximum capacity of each partition based upon either historical data of the geographical segment code or a time predicted in will take to deliver the items in the batch corresponding to each partition;

Dynamically adjusting a size of each partition as the plurality of items are passed through the sequencing component; and

sorting the items of each batch by the sequence numbers as the plurality of items pass through the sequencing component a second time, each of the plurality of partitions sorting only items of its corresponding batch.

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UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 7,423,231 B2
APPLICATION NO. : 10/450296
DATED : September 9, 2008
INVENTOR(S) : John W. Brown

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Claim 1, col. 8, line 3, "in will take" should read --it will take--

Claim 8, col. 8, line 58, "in will take" should read --it will take--

Claim 16, col. 9, line 34, "in will take" should read --it will take--

Signed and Sealed this

Fourth Day of November, 2008

JON W. DUDAS
Director of the United States Patent and Trademark Office